Model 160

DYNAMIC TRANSISTOR TESTER AND POWER SUPPLY

Poc 904

B&K

INSTRUCTION MANUAL

B & K MANUFACTURING COMPANY
1801 W. BELLE PLAINE AVENUE, CHICAGO 13, ILLINOIS

INSTRUCTION MANUAL

FOR

Model 160

TRANSISTOR TESTER

B & K MANUFACTURING COMPANY
1801 West Belle Plaine Avenue
Chicago 13, Illinois

WHAT IT WILL DO

1. The Model 160 transistor tester is a dynamic tester. Further, it is a small AC signal tester. This means that it will give an accurate small AC signal measurement for transistor current gain (Beta).

2. The Model 160 reads directly in Beta. You get a direct numerical value of the current gain of the transistor from the instrument. This is an absolute measurement, not a relative one. There is no guess work.

3. The transistor tester reads the current gain of transistors in the grounded emitter configuration. 98 percent of modern circuits use transistors in this configuration.

4. The Model 160 tests for junction leakage. Gives direct information on shorted, open and leaky junctions.

5. Power transistors can be checked as well as the smaller junction transistors. Their gain and leakage current can be read and matched.

6. The Model 160 will not burn out a transistor. Transistor current and voltage overloads are prevented by careful design. The Model 160 itself is burn-out proof against shorted transistors.

7. Tetrode transistors are tested directly. No external equipment is needed.

8. All transistors are tested under stable test conditions. All are biased to a standard 1 ma. collector current and the input signal is held to the smallest practicable amount.

9. Readings are accurate and dependable. The instrument has an inherent accuracy for beta measurements of $\pm$ 3 percent. This accuracy will hold for the life of the instrument.

10. This tester has its own built-in AC power supply. No batteries are used.

11. The internal power supply may also be used to power transistor radios. The voltage is variable and both voltage and current can be metered with the front panel meter.

BETA TESTING OF TRANSISTORS

Most modern junction transistors are used in the grounded emitter configuration. See Figure 1.

This configuration roughly corresponds to grounded cathode operation of vacuum tubes. It gives good current gain, increased input impedance and a

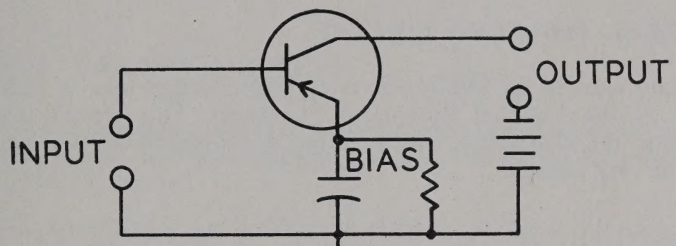


FIG.1

medium output impedance. The grounded emitter circuit is easily biased and stabilized against temperature changes.

The term used to describe the current gain of a transistor in the grounded emitter circuit is "Beta." In the hybrid parameter terms used by engineers this is "h_{fe}." Beta represents the change in output current divided by the change in input current with the collector circuit near a short circuit impedance for signal.

At any given temperature beta is a constant for a junction transistor. All transistors do vary widely in their current gain as the temperature varies. As a matter of fact, continued testing of a transistor may result in a change of beta as a result of changes in internal temperature of the transistor.

Beta is the most useful information you can have about a transistor. It truly represents its merit as an amplifier or oscillator.

Most inexpensive testers do not use the dynamic AC signal method of testing for beta. They read something which approximates beta by reading a change in output current for a change in DC input bias. This usually is a large signal measurement. It may run the transistor into saturation and give highly inaccurate readings. Further, it is a static rather than a dynamic test and leaves the serviceman or laboratory technician with an inaccurate reading or one which requires interpretation.

A few of the inexpensive transistor tests do use an AC signal but this is usually a large signal which may, again, drive the transistor into saturation and give highly inaccurate readings.

All high quality instruments use a small AC signal method in which the output current changes are small and well within the limits set by the operating conditions of the test.

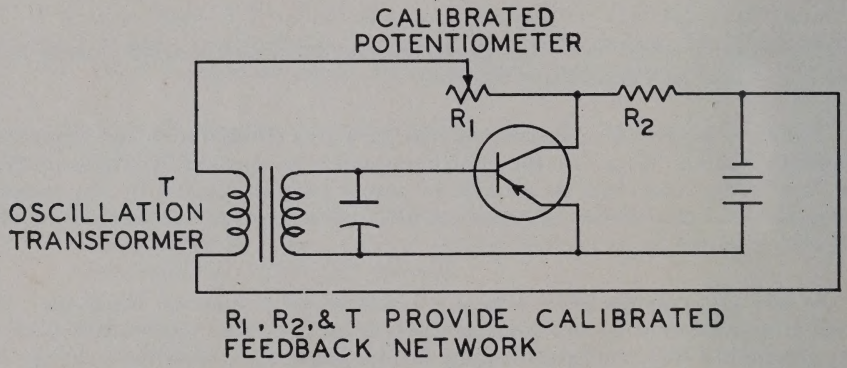
The signal frequency chosen by most transistor manufacturers for the beta test is 1,000 cycles.

Your Model 160 tester combines a very small signal and a signal frequency of about 1,000 cycles, features most desired for accurate and reliable readings.

THE MODEL 160 TEST CIRCUIT

The circuit used in the Model 160 is an improvement upon a basic circuit developed by the National Bureau of Standards. This circuit permits an accurate, fast and economical test by using the transistor to develop its own small AC driving signal.

The transistor is made to oscillate at 1,000 cycles by feeding back a very small portion of its output current into its input circuit. See Figure 2.



R_1, R_2, & T PROVIDE CALIBRATED FEEDBACK NETWORK

FIG. 2

The exact amount of feedback that has to be used to just produce oscillation will be a function of the current gain of the transistor. For transistors having high current gain the amount of energy needed to just produce oscillation will be much smaller than for low current gain transistors.

With careful attention to detail and the use of high quality components with very tight specifications, it is possible to calibrate the unit in terms of the feedback used. This will be an accurate measure of the current gain of the transistor.

To assure that stable DC operating conditions will be held during the test, the transistor is heavily degenerated for DC (but not for AC). All transistors draw about 1 milliampere of DC collector current while being tested. This is the value of collector current most frequently specified for the measurement of beta.

POWER TRANSISTORS

Many power transistors are rated to operate at collector currents in excess of 2 amperes. They show a variation in beta at low collector currents.

The beta variations for high collector currents are small. A hump in the curve can appear in the 20 to 60 ma. region. At 1 ma. collector current, however, the beta value is reduced again to close to the beta of the high current value or may read somewhat lower depending on the transistor; it will seldom read higher.

TETRODE TRANSISTOR TEST

A beta measurement on the rare tetrode transistor types can be made on the Model 160 without additional equipment. Here the second base is returned to the DC emitter potential.

THE LEAKAGE TEST

An open or shorted junction will show up at once in the important beta test. There is another test, however, which gives information which may be important in telling how a transistor operates in a given biasing arrangement.

The preferred test is to measure the collector to base leakage current (I_{co}) with the emitter floating as in Figure 3.

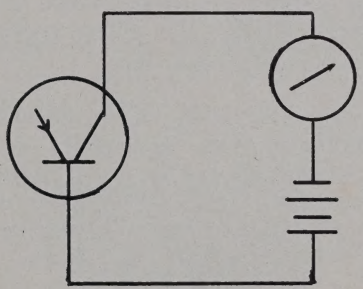


FIG. 3

The I_{co} values of all transistors are measured in this way when the Selector Switch is in the Power PNP or Power NPN position. A direct reading 2 ma. meter scale is provided for this purpose.

Most smaller modern junction transistors have I_{co} values in the order of only a few microamperes and would necessitate a very sensitive and expensive microampere meter movement if this were to be read directly.

For this reason the circuit provides amplification of the small I_{co} values for small junction transistors by the transistor's own beta. This is automatically done when the Selector Switch is in the PNP or NPN positions. The I_{co} value for these small junction transistors may be obtained, if required, merely by dividing the Leakage reading in ma. on the meter by the transistor's own Beta as measured on the instrument. The absolute I_{co} reading is listed on the chart in μamperes. The product of beta and I_{co} which is read by the instrument is also on the chart in the Leakage column and is given in milliamperes.

For Example:

A 2N29 Transistor has a Leakage reading of 1.5 ma. The Beta reading for this transistor is 50. The absolute or true I_{co} is:

$$\frac{1.5 \text{ ma.}}{50} = .03 \text{ ma.} = 30 \ \mu\text{a.}$$

On the chart the maximum I_{co} is listed as 15, therefore it is a defective transistor. The chart also lists .73 ma as the maximum allowable leakage and we measured 1.5 ma., therefore it showed defective on the leakage test.

EXTERNAL POWER SUPPLY FEATURE

The DC power supply output is available at the 2 tip jacks on the panel. The voltage output may be controlled by the Voltage Control potentiometer from 20 volts DC down to 0 volts DC.

The last 2 positions on the Function Switch, EXT VOLTS and EXT CURRENT may be used to monitor the voltage applied to a transistor radio and the current it draws.

This feature will permit rapid testing of the condition of the batteries in a transistor radio by substitution of the Model 160 power supply. Because there is still some small internal resistance in the power supply there may be changes in the current and voltage readings which follow the audio output of the set. These variations can be put to good use in adjusting the alignment of transistor sets and checking the biasing of audio output stage.

HOW TO OPERATE THE MODEL 160

1. Making Connections.

Before inserting a transistor into the tester, be sure that the Function Switch is in the OFF position.

If the transistor has short leads and a standard basing, merely insert it into the transistor socket. If not, then attach the clip leads from the instrument to

the appropriae electrodes. The leads are clearly marked as they exit from the front panel. Some of the most popular transistor lead configurations are shown in Figure 4 below.

BASE DIAGRAMS

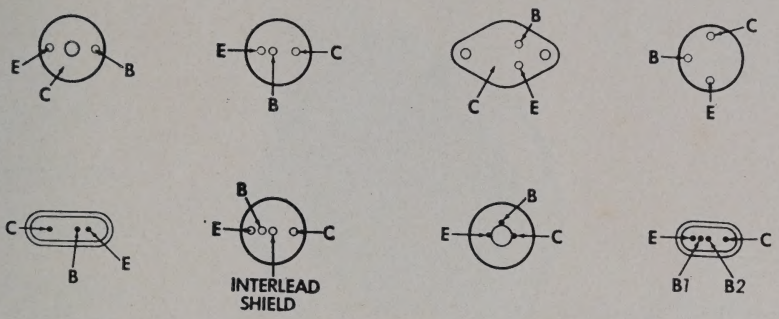


FIGURE 4.

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Be sure that the emitter lead is connected to emitter, base lead to base, and collector lead to collector. If production testing of transistor is desired, a simple fixture can be made to speed testing.

NOTE: Always be sure the Function Switch is in the OFF position when inserting or removing transistors from the tester.

2. Selector Switch.

Set the Selector Switch to the type of transistor to be tested. If in doubt as to whether a transistor is NPN, PNP, POWER PNP or POWER NPN, consult the chart in this manual. See Figure 5.

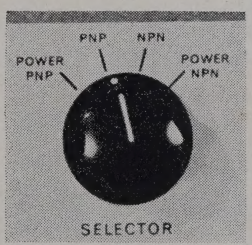

FIGURE 5.

Power transistors are those classed as having more than 150 milliwatts collector dissipation. Many can be recognized by their larger size and large metal heat sinks.

Any transistor can be tested in either the regular or power position. The main difference will be in the leakage test.

3. Function Switch.

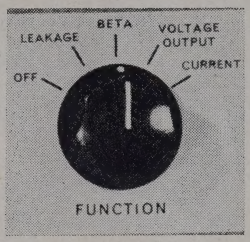

FIGURE 6.

Now switch the Function Switch from OFF to LEAKAGE. See Figure 6.

For power transistors the meter will read I_{co} directly in milliamperes. The full scale value is 2 ma. Consult the chart to compare the value on the meter with the nominal value for the transistor.

For the smaller junction transistor the meter will read I_{co} times beta. The chart gives this Leakage value.

For the exact I_{co} value for a small junction transistor, note the Leakage reading and divide it by the beta value arrived at in the next test.

(A small number of power transistors have I_{co} values in excess of 2 ma. and a small number of junction transistors will have Leakage values also in excess of 2 ma. These are noted in the chart. In these rare cases accept whatever reading occurs and continue on to the beta test.)

Beta Test

Now switch the Function Switch to the beta position.

4. The Beta Dial.

Rotate from

higher Beta

to lower Beta

for best accuracy.

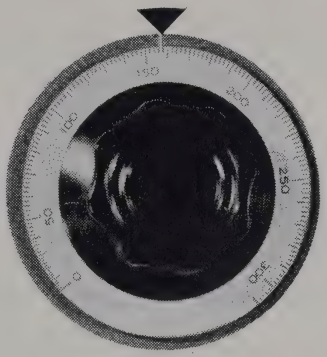

FIGURE 7.

Always rotate the Beta Dial from the high beta to the low beta end. At some point in the rotation there will be a sharp meter deflection upward. This indicates that oscillation has started.

Now repeat this rotation more carefully, approaching from the high beta end until the meter pointer just stands on the Beta Set line on the Beta scale.

Now read the transistor beta directly off the Beta Dial. The beta test is now complete. Be sure to rotate the Function Switch to the OFF position before removing the transistor from the tester.

After testing just one or two transistors, the operation of the Beta Dial will become very familiar and very simple. If the reading is always approached from the high beta end and the meter pointer set to the Beta Set line, the readings will be most accurate and repeatable.

If oscillation cannot be produced on any setting of the Beta Dial the transistor is defective.

Compare beta readings on the tester with the nominal values for the transistor in the chart.

Due to the wide variation in manufacturing tolerances it is not uncommon to find good transistors whose beta varies from the nominal value by as much as 50%. For a transistor whose nominal beta is 70, it is not unusual to find actual beta varying between 40 and 100 on a good transistor.

Tetrode transistors are tested with the exact same procedure as outlined above with the exception that the tetrode's second base lead is connected to the special clip lead provided.

5. External Supply.

The procedure for using the Model 160 to power a battery operated transistor radio is very simple. First, attach the leads from the Model 160 to the battery terminals of the set. Observe battery polarity. Then rotate the *EXTERNAL VOLTAGE* potentiometer to the maximum counter-clockwise direction. Next, rotate the Function Switch to the *EXTERNAL VOLTAGE* position. See Figure 8.

FIGURE 8.

Now adjust the *EXTERNAL VOLTAGE* potentiometer clockwise until the desired voltage is read on the meter.

If the radio set's battery was dead and the set otherwise O.K., the set will now play.

If you wish to read the current drawn by the set, merely rotate the Function Switch to the *EXTERNAL CURRENT* position.

The better designed transistor radios use Class B audio output stages. These produce large current fluctuations when they are operating normally. These current fluctuations with audio can be read on the meter when the Function Switch is in the *EXTERNAL CURRENT* position.

If the current fluctuations are quite large, there will also be some modulation of the voltage reading of the supply. These are normal and are a function of the internal resistance of the supply.

When aligning a transistor set for maximum output, you may make use of the current drawn by the output stage as an indication of the output of the set.

6. IMPORTANT NOTES.

Always return the Function Switch to the OFF position when inserting or removing a transistor from the tester.

Always be sure that all leads of the transistor are securely connected before starting the test.

Junction burn-out may occur if the above cautions are not observed.

SERVICE INFORMATION

The Model 160 should provide long and trouble free life. Any components that may fail can be replaced with standard parts, or procured from the factory. Only four parts affect the calibration. They are, R-9, R-10, R-11 and TO-4. If any of these four parts are replaced, the instrument must be recalibrated. Recalibration can be accomplished in the field, but factory calibration is to be preferred for maximum accuracy. If for any reason the Beta Dial is removed from the instrument, recalibration will be necessary.

FIELD CALIBRATION

1. Set Beta Control to 2400 ohm $\pm$ 5%. Fasten Beta Dial to Control Shaft so that the Dial reads 50. Recheck to see that this reading occurs at 2400 ohm $\pm$ 5%.

2. Using transistors whose Beta is accurately known, trim R-9 and R-16 for tracking of the Beta Dial. R-10 tracks the low end and a transistor with a Beta around 40 or 50 should be used. R-9 tracks the high end and a transistor whose Beta is around 150 to 200 should be used. whose Beta is around 150 to 200 should be used.

These adjustments inter-act on each other and the trimming at high and low end should be repeated for maximum accuracy.

INSTRUCTIONS FOR USE OF CHART

Transistors are listed in numerical order in the left hand column. The second column indicates whether the transistor is PNP or NPN for setting the position of the selector switch. The third column is Beta. This is the nominal value of Beta as shown on manufacturers' specification sheets. Column four indicates the maximum I_{co} allowable. This value is given in micro amperes. This value is not read directly on the Model 160 but can be obtained by dividing the leakage reading by the measured Beta. For power transistors the leakage reading is I_{co} directly. Column five or Leakage indicates the product of I_{co} and nominal Beta. In general, the number listed in this column is the maximum accepted value for leakage as read on the meter. Since power transistors indicate I_{co} directly in the leakage test, no value will be found in this column. The word POWER appears instead.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)	TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N29	NPN	49	15	.73	2N68	PNP	40	5 ma.	POWER
2N34	PNP	75	50	3.75	2N77	PNP	55	10	.55
2N35	NPN	75	50	3.75	2N78	NPN	70	3	.21
2N43	PNP	53	16	.84	2N94	NPN	10	50	.50
2N43A	PNP	53	8	.42	2N94A	NPN	25	50	1.25
2N44	PNP	31	16	.49	2N95	NPN	40	5 ma.	POWER
2N44A	PNP	31	8	.24	2N97	NPN	13	2	.02
2N45	PNP	12	10	.12	2N97A	NPN	13	2	.02
2N59	PNP	90	15	1.35	2N98	NPN	40	2	.08
2N59A	PNP	90	15	1.35	2N98A	NPN	40	2	.08
2N59B	PNP	90	15	1.35	2N99	NPN	40	2	.08
2N59C	PNP	90	15	1.35	2N101	PNP	40	5 ma.	POWER
2N60	PNP	70	15	1.05	2N102	NPN	40	5 ma.	POWER
2N60A	PNP	70	15	1.05	2N103	NPN	4	5	.02
2N60B	PNP	70	15	1.05	2N104	PNP	44	20	.88
2N60C	PNP	70	15	1.05	2N105	PNP	55	5	.27
2N61	PNP	45	15	.67	2N107	PNP	19	10	.19
2N61A	PNP	45	15	.67	2N109	PNP	75	14	1.05
2N61B	PNP	45	15	.67	2N115	PNP	45	0.10 ma.	POWER
2N61C	PNP	45	15	.67	2N117	NPN	15	10	.15

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N118	NPN	29	10	.29
2N118A	NPN	54	10	.54
2N119	NPN	63	10	.63
2N120	NPN	200	10	2.00
2N122	NPN	3	0.10 ma.	POWER
2N123	PNP	65	6	.39
2N125	NPN	36	2	.07
2N126	NPN	74	2	.14
2N128	PNP	40	15	.60
2N129	PNP	20	3	.06
2N130A	PNP	26	15	.39
2N131A	PNP	45	15	.67
2N132A	PNP	90	15	1.35
2N133A	PNP	50	15	.75
2N135	PNP	20	5	.10
2N136	PNP	40	5	.20
2N137	PNP	60	5	.30
2N139	PNP	48	10	.48
2N140	PNP	75	10	.75
2N141	PNP	40	5 ma.	POWER
2N142	NPN	40	5 ma.	POWER
2N143	PNP	40	5 ma.	POWER
2N144	NPN	40	5 ma.	POWER
2N145				
2N146				
2N147	NPN	—	3	—
2N155	PNP	32	1 ma.	POWER
2N156	PNP	32	1 ma.	POWER
2N157	PNP	20	1 ma.	POWER
2N157A	PNP	20	1 ma.	POWER
2N158	PNP	21	1 ma.	POWER
2N158A	PNP	20	1 ma.	POWER
2N160	NPN	13	5	.06
2N160A	NPN	13	5	.06
2N161	NPN	28	5	.14
2N161A	NPN	28	5	.14
2N162	NPN	39	5	.19
2N162A	NPN	39	5	.19
2N163	NPN	49	5	.24
2N163A	NPN	49	5	.24
2N167	NPN	30	1.5	.04
2N168A	NPN	40	5	.20
2N169	NPN	72	5	.36
2N169A	NPN	72	5	.36
2N170	NPN	20	3	.06
2N172	NPN	—	3	—
2N173	PNP	52.5	8 ma.	POWER
2N174	PNP	37.5	8 ma.	POWER
2N174A	PNP	25	15 ma.	POWER
2N175	PNP	65	12	.78
2N176	PNP	50	3 ma.	POWER
2N178	PNP	30	3 ma.	POWER
2N185	PNP	80	15	1.20
2N186	PNP	24	16	.38
2N186A	PNP	24	16	.38
2N187	PNP	36	16	.57
2N187A	PNP	36	16	.57
2N188	PNP	54	16	.86
2N188A	PNP	54	16	.86
2N189	PNP	24	16	.38
2N190	PNP	36	16	.57
2N191	PNP	54	16	.86
2N192	PNP	75	16	1.20
2N193	NPN	10	50	.50
2N194	NPN	8	25	.20
2N194A	NPN	8	50	.40
2N206	PNP	47	10	.47
2N207	PNP	100	15	1.50
2N207A	PNP	100	10	1.00
2N207B	PNP	100	10	1.00

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N211	NPN	10	20	.20
2N212	NPN	20	50	1.00
2N213	NPN	150	50	7.50
2N213A*	NPN			
2N214	NPN	75	50	3.75
2N215	PNP	44	20	.88
2N216	NPN	7.5	50	.37
2N217	PNP	75	14	1.05
2N218	PNP	48	10	.48
2N219	PNP	75	10	.75
2N220	PNP	65	12	.78
2N223	PNP	110	20	2.20
2N224	PNP	90	25	2.25
2N225*				
2N226	PNP	60	25	1.50
2N227*				
2N228	NPN	60	100	6.00
2N229	NPN	75	100	7.50
2N233	NPN	5	50	.25
2N233A	NPN	9	50	.45
2N234A	PNP	25	—	POWER
2N235A	PNP	40	—	POWER
2N235B	PNP	60	—	POWER
2N236A	PNP	40	—	POWER
2N236B	PNP	60	—	POWER
2N238	PNP	—	20	—
2N240	PNP	30	3	.09
2N241	PNP	73	16	1.16
2N241A	PNP	73	16	1.16
2N242	PNP	40	5 ma.	POWER
2N243	NPN	20	—	—
2N244	NPN	59	—	—
2N247	PNP	60	16	.96
2N248	PNP	20	10	.20
2N250	PNP	90	—	POWER

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N251	PNP	90	—	POWER
2N252	PNP	—	10	—
2N253	NPN	—	3	--
2N254	NPN	—	3	—
2N255	PNP	30	1 ma.	POWER
2N255A	PNP	30	5 ma.	POWER
2N256	PNP	30	1 ma.	POWER
2N256A	PNP	30	5 ma.	POWER
2N257	PNP	50	2 ma.	POWER
2N265	PNP	110	16	1.76
2N268	PNP	50	2 ma.	POWER
2N268A	PNP	20	—	POWER
2N269	PNP	40	20	.80
2N270	PNP	70	10	.70
2N274	PNP	60	10	.60
2N277	PNP	52.5	8 ma.	POWER
2N278	PNP	52.5	8 ma.	POWER
2N279	PNP	30	12	.36
2N280	PNP	47	12	.56
2N281	PNP	70	4.5	.31
2N283	PNP	40	4.5	.18
2N284	PNP	22	10	.22
2N284A	PNP	22	10	.22
2N285A	PNP	150	1 ma.	POWER
2N291	PNP	45	25	1.12
2N292	NPN	25	5	.12
2N293	NPN	25	5	.12
2N296	PNP	30	—	POWER
2N297	PNP	26	3 ma.	POWER
2N297A	PNP	70	3 ma.	POWER
2N299	PNP	—	3	—
2N300	PNP	18	3	.05
2N301	PNP	70	3 ma.	POWER
2N301A	PNP	70	3 ma.	POWER
2N306	NPN	75	50	.375

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N307	PNP	30	15 ma.	POWER
2N307A	PNP	35	5 ma.	POWER
2N308	PNP	—	10	—
2N309	PNP	—	10	—
2N310	PNP	—	10	—
2N311	PNP	50	60	3.00
2N312	NPN	50	60	3.00
2N315	PNP	20	25	.50
2N315A	PNP	35	25	.87
2N316	PNP	30	25	.75
2N316A	PNP	35	25	.87
2N317	PNP	30	25	.75
2N317A	PNP	40	25	1.00
2N319	PNP	53	16	.84
2N320	PNP	48	16	.76
2N321	PNP	80	16	1.28
2N322	PNP	42	16	.67
2N323	PNP	70	16	1.12
2N324	PNP	80	16	1.28
2N325	PNP	35	0.50 ma.	POWER
2N326	NPN	35	0.50 ma.	POWER
2N327A	PNP	15	0.1	.0015
2N328A	PNP	30	0.1	.003
2N329A	PNP	60	0.1	.006
2N331	PNP	50	16	.80
2N332	NPN	15	—	—
2N332A	NPN	9	—	—
2N333	NPN	29	—	—
2N333A	NPN	18	—	—
2N334	NPN	54	10	.54
2N334A	NPN	18	—	—
2N335	NPN	63	10	.63
2N335A	NPN	37	—	—
2N336	NPN	200	10	2.00
2N336A	NPN	76	—	—

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N337	NPN	65	—	—
2N338	NPN	99	—	—
2N339	NPN	50	1	.05
2N340	NPN	50	1	.05
2N341	NPN	50	1	.05
2N342	NPN	20	1	.02
2N342A	NPN	20	1	.02
2N343	NPN	59	1	.05
2N344	PNP	22	3	.06
2N345	PNP	35	3	.10
2N346	PNP	20	3	.06
2N347	NPN	49	0.05	.002
2N348	NPN	24	0.10	.002
2N349	NPN	19	0.50	.009
2N350	PNP	40	3 ma.	POWER
2N350A	PNP	30	3 ma.	POWER
2N351	PNP	57.5	3 ma.	POWER
2N351A	PNP	45	3 ma.	POWER
2N356	NPN	30	25	.75
2N356A	NPN	35	25	.87
2N357	NPN	30	25	.75
2N357A	NPN	40	25	1.00
2N358	NPN	30	25	.75
2N358A	NPN	40	25	1.00
2N359	PNP	150	25	3.75
2N360	PNP	100	25	2.50
2N361	PNP	70	25	1.75
2N362	PNP	100	25	2.50
2N363	PNP	50	25	1.25
2N364	NPN	15	10	.15
2N365	NPN	34	10	.34
2N366	NPN	95	10	.95
2N367	PNP	15	—	—
2N368	PNP	34	—	—
2N369	PNP	95	—	—

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N370	PNP	60	20	1.20
2N371	PNP	60	20	1.20
2N372	PNP	60	20	1.20
2N373	PNP	60	8	.48
2N374	PNP	60	8	.48
2N375	PNP	55	3 ma.	POWER
2N376	PNP	77.5	3 ma.	POWER
2N376A	PNP	60	—	POWER
2N377	NPN	40	10	.40
2N378	PNP	30	0.50 ma.	POWER
2N379	PNP	30	0.50 ma.	POWER
2N380	PNP	50	0.50 ma.	POWER
2N381	PNP	32	20	.64
2N382	PNP	52	10	.52
2N383	PNP	72	10	.72
2N384	PNP	60	—	—
2N385	NPN	70	10	.70
2N386	PNP	40	0.50 ma.	POWER
2N387	PNP	45	5 ma.	POWER
2N388	NPN	120	10	1.20
2N389	NPN	36	10 ma.	POWER
2N392	PNP	200	8 ma.	POWER
2N393	PNP	95	5	.47
2N394	PNP	20	6	.12
2N395	PNP	87	6	.52
2N396	PNP	90	6	.54
2N397	PNP	90	6	.54
2N398	PNP	60	14	.84
2N399	PNP	40	1 ma.	POWER
2N400	PNP	50	2 ma.	POWER
2N401	PNP	40	1 ma.	POWER
2N402	PNP	25	15	.37
2N403	PNP	35	15	.52
2N404	PNP	40	5	.20
2N405	PNP	35	14	.49

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N406	PNP	35	14	.49
2N407	PNP	75	14	1.05
2N408	PNP	75	14	1.05
2N409	PNP	48	10	.48
2N410	PNP	48	10	.48
2N411	PNP	75	10	.75
2N412	PNP	75	10	.75
2N413	PNP	30	5	.15
2N413A	PNP	30	—	—
2N414	PNP	60	5	.30
2N414A	PNP	60	—	—
2N415A	PNP	80	—	—
2N416	PNP	80	5	.40
2N417	PNP	140	5	.70
2N418	PNP	40	1.50 ma.	POWER
2N419	PNP	60	1 ma.	POWER
2N420	PNP	50	1.50 ma.	POWER
2N420A	PNP	50	0.50 ma.	POWER
2N422	PNP	50	15	.75
2N424	NPN	36	10 ma.	POWER
2N425	PNP	30	4	.12
2N426	PNP	40	4	.16
2N427	PNP	55	4	.22
2N428	PNP	80	4	.32
2N438	NPN	25	10	.25
2N438A	NPN	25	10	.25
2N439	NPN	45	10	.45
2N439A	NPN	45	10	.45
2N440	NPN	70	10	.70
2N440A	NPN	70	10	.70
2N441	PNP	30	8 ma.	POWER
2N442	PNP	30	8 ma.	POWER
2N443	PNP	30	8 ma.	POWER
2N444	NPN	15	25	.37
2N444A	NPN	30	25	.75

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N445	NPN	35	25	.87
2N445A	NPN	90	25	2.25
2N446	NPN	60	25	1.50
2N446A	NPN	150	25	3.75
2N447	NPN	125	25	3.12
2N447A	NPN	200	25	5.00
2N448	NPN	8	5	.04
2N449	NPN	72	5	.36
2N450	PNP	30	6	.18
2N451	NPN	10	20 ma.	POWER
2N452	NPN	12	50 ma.	POWER
2N453	NPN	30	20 ma.	POWER
2N454	NPN	15	20 ma.	POWER
2N456	PNP	30	0.50 ma.	POWER
2N457	PNP	30	0.50 ma.	POWER
2N458	PNP	30	0.50 ma.	POWER
2N459	PNP	30	0.50 ma.	POWER
2N460	PNP	24	15	.36
2N461	PNP	49	15	.73
2N462	PNP	45	35	1.57
2N463	PNP	27	0.30 ma.	POWER
2N464	PNP	26	15	.39
2N465	PNP	45	15	.67
2N466	PNP	90	15	1.35
2N467	PNP	180	15	2.70
2N468	NPN	47.5	2 ma.	POWER
2N470	NPN	16	—	—
2N471	NPN	16	—	—
2N471A	NPN	25	—	—
2N472	NPN	16	—	—
2N473	NPN	30	—	—
2N474	NPN	30	—	—
2N474A	NPN	50	—	—
2N475	NPN	30	—	—
2N478	NPN	60	—	—

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N479	NPN	60	—	—
2N479A	NPN	80	—	—
2N480A	NPN	60	—	—
2N481	PNP	50	10	.50
2N482	PNP	50	10	.50
2N483	PNP	60	10	.60
2N484	PNP	90	10	.90
2N485	PNP	50	10	.50
2N486	PNP	100	10	1.00
2N495	PNP	15	1	.01
2N496	PNP	10	0.10	.001
2N497	NPN	24	0.010 ma.	POWER
2N498	NPN	24	0.010 ma.	POWER
2N499	PNP	8.5	15	.12
2N501	PNP	75	5	.37
2N501A	PNP	75	5	.37
2N502	PNP	45	100	4.50
2N502A	PNP	65	5	.32
2N503	PNP	45	100	4.50
2N504	PNP	16	10	.16
2N505	PNP	40	—	—
2N508	PNP	112	16	1.79
2N509	PNP	49	5	.24
2N511	PNP	12	2 ma.	POWER
2N511A	PNP	12	2 ma.	POWER
2N511B	PNP	12	2 ma.	POWER
2N512	PNP	12	2 ma.	POWER
2N512A	PNP	12	2 ma.	POWER
2N512B	PNP	12	2 ma.	POWER
2N513	PNP	12	2 ma.	POWER
2N513A	PNP	12	2 ma.	POWER
2N513B	PNP	12	2 ma.	POWER
2N514	PNP	12	2 ma.	POWER
2N514A	PNP	12	2 ma.	POWER
2N514B	PNP	12	2 ma.	POWER

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE (ma.)
2N515	NPN	7.5	50	.37
2N516	NPN	7.5	50	.37
2N517	NPN	7.5	50	.37
2N518	PNP	60	6	.36
2N519	PNP	25	25	.62
2N519A	PNP	35	25	.87
2N520	PNP	40	25	1.00
2N520A	PNP	100	25	2.50
2N521	PNP	7	25	.17
2N521A	PNP	150	25	3.75
2N522	PNP	120	25	3.00
2N522A	PNP	200	25	5.00
2N523	PNP	200	25	5.00
2N523A	PNP	250	25	6.25
2N524	PNP	35	10	.35
2N525	PNP	52	10	.52
2N526	PNP	73	10	.73
2N527	PNP	91	10	.91
2N529	NPN	18	25	.45
2N530	NPN	23	25	.57
2N531	NPN	28	25	.70
2N532	NPN	33	25	.82
2N533	NPN	38	25	.95
2N534	PNP	85	15	1.27
2N535	PNP	100	10	1.00
2N535A	PNP	100	10	1.00
2N535B	PNP	100	10	1.00
2N536	PNP	150	10	1.50
2N538	PNP	30	2 ma.	POWER
2N538A				POWER
2N539				POWER
2N539A				POWER
2N540				POWER
2N540A				POWER
2N541	NPN	130	—	—

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE (ma.)
2N542	NPN	130	—	—
2N543	NPN	130	—	—
2N544	PNP	60	4	.24
2N545	NPN	25	—	—
2N546	NPN	25	—	—
2N547	NPN	35	—	—
2N548	NPN	35	—	—
2N549	NPN	35	—	—
2N550	NPN	35	—	—
2N551	NPN	30	—	—
2N552	NPN	30	—	—
2N553	PNP	60	2 ma.	POWER
2N554	PNP	45	—	POWER
2N555	PNP	65	—	POWER
2N556	NPN	50	—	—
2N557	NPN	30	10	.30
2N558	NPN	75	10	.75
2N559	PNP	25	—	—
2N560	NPN	50	0.10	.005
2N561	PNP	75	0.50 ma.	POWER
2N563	PNP	25	25	.62
2N564	PNP	25	25	.62
2N565	PNP	55	25	1.37
2N566	PNP	55	25	1.37
2N567	PNP	100	25	2.50
2N568	PNP	100	25	2.50
2N569	PNP	150	25	3.75
2N570	PNP	150	25	3.75
2N571	PNP	200	25	5.00
2N572	PNP	200	25	5.00
2N574	PNP	14	7 ma.	POWER
2N574A	PNP	14	20 ma.	POWER
2N575	PNP	25	7 ma.	POWER
2N575A	PNP	25	20 ma.	POWER
2N576	NPN	30	20	.60

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N576A	NPN	30	40	1.20
2N578	PNP	15	20	.30
2N579	PNP	30	20	.60
2N580	PNP	45	20	.90
2N581	PNP	30	20	.60
2N582	PNP	60	5	.30
2N583	PNP	30	6	.18
2N584	PNP	60	5	.30
2N585	NPN	40	6	.24
2N586	PNP	60	16	.96
2N587	NPN	30	50	1.50
2N588	PNP	—	15	—
2N591	PNP	70	7	.49
2N592	PNP	40	25	1.00
2N593	PNP	80	25	2.00
2N594	NPN	30	25	.75
2N595	NPN	45	25	1.12
2N596	NPN	60	25	1.50
2N597	PNP	70	25	1.75
2N598	PNP	125	25	3.12
2N599	PNP	175	25	4.37
2N600	PNP	125	25	3.12
2N601	PNP	175	25	4.37
2N602	PNP	50	25	1.25
2N603	PNP	63	25	1.57
2N604	PNP	90	25	2.25
2N609	PNP	90	25	2.25
2N610	PNP	65	25	1.62
2N611	PNP	45	15	.67
2N612	PNP	25	25	.62
2N613	PNP	35	25	.87
2N614	PNP	4.5	6	.02
2N615	PNP	7.5	6	.04
2N616	PNP	25	6	.15
2N617	PNP	15	6	.09

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N618	PNP	90	3 ma.	POWER
2N619	NPN	15	0.10	.001
2N620	NPN	30	0.10	.003
2N621	NPN	60	0.10	.006
2N623	PNP	35	10	.35
2N624	PNP	30	30	.90
2N625	NPN	50	0.10 ma.	POWER
2N626	NPN	24	—	POWER
2N627	PNP	20	3 ma.	POWER
2N628	PNP	20	3 ma.	POWER
2N629	PNP	20	3 ma.	POWER
2N630	PNP	20	3 ma.	POWER
2N631	PNP	150	25	3.75
2N632	PNP	100	25	2.50
2N633	PNP	25	25	.62
2N634	NPN	15	5	.07
2N635	NPN	25	5	.12
2N636	NPN	35	5	.17
2N637	PNP	45	1 ma.	POWER
2N637A	PNP	45	5 ma.	POWER
2N637B	PNP	45	5 ma.	POWER
2N638	PNP	30	1 ma.	POWER
2N638A	PNP	30	5 ma.	POWER
2N638B	PNP	30	5 ma.	POWER
2N639	PNP	22.5	1 ma.	POWER
2N639A	PNP	22.5	5 ma.	POWER
2N639B	PNP	22.5	5 ma.	POWER
2N640	PNP	60	—	—
2N641	PNP	60	—	—
2N642	PNP	60	—	—
2N643	PNP	45	—	—
2N644	PNP	45	—	—
2N645	PNP	45	—	—
2N647	NPN	70	14	.98
2N649	PNP	65	—	—

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE (ma.)
2N650	PNP	40	15	.60
2N651	PNP	75	15	1.12
2N652	PNP	160	15	2.40
2N653	PNP	40	15	.60
2N654	PNP	75	15	1.12
2N655	PNP	160	15	2.40
2N656	NPN	60	0.010 ma.	POWER
2N657	NPN	60	0.010 ma.	POWER
2N658	PNP	50	25	1.25
2N659	PNP	70	25	1.75
2N660	PNP	90	25	2.25
2N661	PNP	120	25	3.00
2N662	PNP	60	25	1.50
2N665	PNP	60	2 ma.	POWER
2N669	PNP	100	3 ma.	POWER
2N670	PNP	100	75	7.50
2N671	PNP	100	75	7.50
2N672	PNP	—	75	—
2N673	PNP	—	75	—
2N674	PNP	100	0.10 ma.	POWER
2N675	PNP	100	0.10 ma.	POWER
2N676	PNP	15	—	POWER
2N677	PNP	40	2 ma.	POWER
2N677A	PNP	40	2 ma.	POWER
2N677B	PNP	40	5 ma.	POWER
2N677C	PNP	40	5 ma.	POWER
2N678	PNP	75	2 ma.	POWER
2N678A	PNP	75	2 ma.	POWER
2N678B	PNP	75	5 ma.	POWER
2N678C	PNP	75	5 ma.	POWER
2N679	NPN	30	25	.75
2N680	PNP	35	14	.49
2N695	PNP	30	10	.30
2N696	PNP	40	—	—
2N697	PNP	70	—	—

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE (ma.)
2N699	NPN	75	—	—
2N700	PNP	10	10	.10
2N702	NPN	30	—	—
2N705	PNP	40	3	.12
2N706	NPN	45	—	—
2N710	PNP	40	3	.12
2N1000	NPN	35	15	.52
2N1008	PNP	90	—	—
2N1008A	PNP	90	—	—
2N1008B	PNP	90	—	—
2N1010	NPN	35	—	—
2N1011	PNP	150	15 ma.	POWER
2N1012	NPN	50	25	1.25
2N1013	PNP	30	1 ma.	POWER
2N1014	PNP	75	0.50 ma.	POWER
2N1017	PNP	100	—	—
2N1021	PNP	23	0.50 ma.	POWER
2N1022	PNP	25	0.50 ma.	POWER
2N1024	PNP	9	.025	.00022
2N1025	PNP	14	.025	.00035
2N1026	PNP	27	.025	.00067
2N1026A	PNP	36	.025	.0009
2N1027	PNP	18	.025	.00045
2N1028	PNP	9	.025	.00022
2N1029	PNP	40	2 ma.	POWER
2N1029A	PNP	40	2 ma.	POWER
2N1029B	PNP	40	5 ma.	POWER
2N1029C	PNP	40	5 ma.	POWER
2N1030	PNP	75	2 ma.	POWER
2N1030A	PNP	75	2 ma.	POWER
2N1030B	PNP	75	5 ma.	POWER
2N1030C	PNP	75	5 ma.	POWER
2N1031	PNP	40	2 ma.	POWER
2N1031A	PNP	40	2 ma.	POWER
2N1031B	PNP	40	5 ma.	POWER

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1031C	PNP	40	5 ma.	POWER
2N1032	PNP	75	2 ma.	POWER
2N1032A	PNP	75	2 ma.	POWER
2N1032B	PNP	75	5 ma.	POWER
2N1032C	PNP	75	5 ma.	POWER
2N1034	PNP	15	0.10	.001
2N1035	PNP	30	0.10	.003
2N1036	PNP	60	0.10	.006
2N1037	PNP	30	0.10	.003
2N1038	PNP	35	0.125 ma.	POWER
2N1039	PNP	35	0.125 ma.	POWER
2N1040	PNP	35	0.125 ma.	POWER
2N1041	PNP	35	0.125 ma.	POWER
2N1042	PNP	25	0.125 ma.	POWER
2N1043	PNP	25	0.125 ma.	POWER
2N1044	PNP	25	0.125 ma.	POWER
2N1045	PNP	25	0.125 ma.	POWER
2N1046	PNP	70	1 ma.	POWER
2N1047	NPN	24	0.015 ma.	POWER
2N1048	NPN	24	0.015 ma.	POWER
2N1049	NPN	60	0.015 ma.	POWER
2N1050	NPN	60	0.015 ma.	POWER
2N1056	PNP	32	25	.80
2N1057	PNP	58	16	.92
2N1058	NPN	17	50	.85
2N1059	NPN	75	50	3.75
2N1060	NPN	15	0.10	.0015
2N1065	PNP	50	50	2.50
2N1067	NPN	35	0.50 ma.	POWER
2N1068	NPN	35	0.50 ma.	POWER
2N1069	NPN	20	1 ma.	POWER
2N1070	NPN	20	1 ma.	POWER
2N1072	NPN	13	0.10	.001
2N1073	PNP	40	—	POWER
2N1073A	PNP	40	5 ma.	POWER

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1073B	PNP	40	10 ma.	POWER
2N1074	NPN	15	0.10	.001
2N1075	NPN	28	0.10	.002
2N1076	NPN	60	0.10	.006
2N1077	NPN	25	0.10	.002
2N1086	NPN	17	—	—
2N1086A	NPN	17	—	—
2N1087	NPN	17	—	—
2N1090	NPN	50	25	1.25
2N1091	NPN	70	25	1.75
2N1092	NPN	35	0.50 ma.	POWER
2N1095	NPN	36	—	—
2N1096	NPN	35	—	—
2N1097	PNP	34	16	.54
2N1098	PNP	34	16	.54
2N1099	PNP	52.5	8 ma.	POWER
2N1100	PNP	37.5	8 ma.	POWER
2N1101	NPN	40	50	2.00
2N1102	NPN	40	50	2.00
2N1107	PNP	34	10	.34
2N1108	PNP	33	10	.33
2N1109	PNP	20	10	.20
2N1110	PNP	29	10	.29
2N1111	PNP	25	10	.25
2N1111A	PNP	25	10	.25
2N1111B	PNP	25	10	.25
2N1114	NPN	110	30	3.30
2N1115	PNP	—	6	—
2N1116	NPN	70	—	—
2N1117	NPN	70	—	—
2N1118	PNP	15	1	.01
2N1119	PNP	10	—	—
2N1120	PNP	35	15 ma.	POWER
2N1121	NPN	34	5	.17
2N1122	PNP	95	5	.47

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1122A	PNP	95	5	.47
2N1123	PNP	70	25	1.75
2N1124	PNP	110	75	8.25
2N1125	PNP	70	75	5.25
2N1126	PNP	40	75	3.00
2N1127	PNP	100	75	7.50
2N1128	PNP	100	20	2.00
2N1129	PNP	165	25	4.12
2N1130	PNP	125	25	3.12
2N1131	PNP	25	—	—
2N1132	PNP	40	—	—
2N1136	PNP	75	1 ma.	POWER
2N1136A	PNP	75	5 ma.	POWER
2N1136B	PNP	75	5 ma.	POWER
2N1137	PNP	112.5	1 ma.	POWER
2N1137A	PNP	112.5	5 ma.	POWER
2N1137B	PNP	112.5	5 ma.	POWER
2N1138	PNP	150	1 ma.	POWER
2N1138A	PNP	150	5 ma.	POWER
2N1138B	PNP	150	5 ma.	POWER
2N1139	NPN	40	5	.20
2N1140	NPN	50	15	.75
2N1141	PNP	32	—	—
2N1142	PNP	32	—	—
2N1143	PNP	32	—	—
2N1144	PNP	34	16	.54
2N1145	PNP	34	16	.54
2N1146	PNP	30	2 ma.	POWER
2N1146A	PNP	30	2 ma.	POWER
2N1146B	PNP	30	2 ma.	POWER
2N1146C	PNP	30	2 ma.	POWER
2N1147	PNP	30	2 ma.	POWER
2N1147A	PNP	30	2 ma.	POWER
2N1147B	PNP	30	2 ma.	POWER
2N1147C	PNP	30	2 ma.	POWER

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1149	NPN	13	2	.02
2N1150	NPN	24	2	.04
2N1151	NPN	56	2	.11
2N1152	NPN	63	2	.12
2N1153	NPN	200	2	.40
2N1154	NPN	15	5	.07
2N1155	NPN	15	6	.09
2N1156	NPN	15	8	.12
2N1159	PNP	150	8 ma.	POWER
2N1160	PNP	100	8 ma.	POWER
2N1162	PNP	25	15 ma.	POWER
2N1163	PNP	25	15 ma.	POWER
2N1164	PNP	25	15 ma.	POWER
2N1165	PNP	25	15 ma.	POWER
2N1166	PNP	25	15 ma.	POWER
2N1167	PNP	25	15 ma.	POWER
2N1168	PNP	110	8 ma.	POWER
2N1172	PNP	60	0.20 ma.	POWER
2N1176	PNP	20	0.025 ma.	POWER
2N1176A	PNP	20	0.030 ma.	POWER
2N1176B	PNP	20	0.035 ma.	POWER
2N1191	PNP	40	—	—
2N1192	PNP	75	—	—
2N1193	PNP	160	—	—
2N1195	PNP	49	5	.24
2N1198	NPN	17	—	—
2N1199	NPN	25	5	.12
2N1206	NPN	35	15	.52
2N1207	NPN	50	15	.75
2N1208	NPN	15	10 ma.	POWER
2N1209	NPN	20	20 ma.	POWER
2N1212	NPN	15	10 ma.	POWER
2N1219	PNP	18	0.10	.001
2N1220	PNP	9	0.10	.0009
2N1221	PNP	18	0.10	.0018

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1222	PNP	9	0.10	.0009
2N1223	PNP	10	0.10	.001
2N1224	PNP	60	—	—
2N1225	PNP	60	—	—
2N1226	PNP	60	—	—
2N1228	PNP	20	0.10	.002
2N1229	PNP	40	0.10	.004
2N1230	PNP	14	0.10	.001
2N1231	PNP	25	0.10	.002
2N1232	PNP	14	0.10	.001
2N1233	PNP	25	0.10	.002
2N1234	PNP	14	0.10	.001
2N1238	PNP	20	0.10	.002
2N1239	PNP	40	0.10	.004
2N1240	PNP	14	0.10	.001
2N1241	PNP	25	0.10	.002
2N1242	PNP	14	0.10	.001
2N1243	PNP	25	0.10	.002
2N1244	PNP	14	0.10	.001
2N1245	PNP	50	5 ma.	POWER
2N1246	PNP	150	5 ma.	POWER
2N1247	NPN	25	—	—
2N1248	NPN	20	—	—
2N1249	NPN	38	—	—
2N1251	NPN	150	50	7.50
2N1252	NPN	30	—	—
2N1253	NPN	55	—	—
2N1254	PNP	15	0.20	.003
2N1255	PNP	50	0.20	.01
2N1256	PNP	15	0.20	.003
2N1257	PNP	50	0.20	.01
2N1258	PNP	15	0.20	.003
2N1259	PNP	50	0.20	.01
2N1261	PNP	30	2 ma.	POWER
2N1262	PNP	43	2 ma.	POWER

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1263	PNP	64	2 ma.	POWER
2N1264	PNP	25	50	1.25
2N1265	PNP	75	—	—
2N1266	PNP	—	—	—
2N1267	NPN	11	5	.05
2N1268	NPN	24	5	.12
2N1269	NPN	32	5	.16
2N1270	NPN	11	5	.05
2N1271	NPN	24	5	.12
2N1272	NPN	32	5	.16
2N1273	PNP	50	—	—
2N1274	PNP	50	—	—
2N1275	NPN	15	1	.01
2N1276	NPN	9	—	—
2N1277	NPN	18	—	—
2N1278	NPN	37	—	—
2N1279	NPN	76	—	—
2N1280	PNP	60	10	.60
2N1281	PNP	90	10	.90
2N1282	PNP	100	10	1.00
2N1284	PNP	65	6	.39
2N1291	PNP	40	1.5 ma.	POWER
2N1292	NPN	30	1.0 ma.	POWER
2N1293	PNP	40	1.5 ma.	POWER
2N1294	NPN	30	2 ma.	POWER
2N1295	PNP	40	2 ma.	POWER
2N1296	NPN	30	3 ma.	POWER
2N1297	PNP	40	2 ma.	POWER
2N1298	NPN	30	4 ma.	POWER
2N1299	NPN	50	—	—
2N1300	PNP	50	20	1.00
2N1301	PNP	75	20	1.50
2N1302	NPN	50	6	.30
2N1303	PNP	50	6	.30
2N1304	NPN	70	6	.42

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1305	PNP	70	6	.42
2N1306	NPN	100	6	.60
2N1307	PNP	100	6	.60
2N1308	NPN	150	6	.90
2N1309	PNP	150	6	.90
2N1310	NPN	35	25	.87
2N1311	NPN	30	25	.75
2N1312	NPN	40	25	1.00
2N1313	PNP	40	—	—
2N1316	PNP	100	25	2.50
2N1317	PNP	95	25	2.37
2N1318	PNP	85	20	1.70
2N1335	NPN	13	—	—
2N1336	NPN	13	—	—
2N1337	NPN	13	—	—
2N1339	NPN	—	—	—
2N1340	NPN	—	—	—
2N1341	NPN	—	—	—
2N1343	PNP	40	6	.24
2N1344	PNP	90	10	.90
2N1345	PNP	60	6	.36
2N1346	PNP	125	5	.62
2N1347	PNP	80	6	.48
2N1348	PNP	95	10	.95
2N1349	PNP	115	10	1.15
2N1350	PNP	95	20	1.90
2N1351	PNP	65	10	.65
2N1352	PNP	70	5	.35
2N1353	PNP	70	6	.42
2N1354	PNP	70	6	.42
2N1355	PNP	80	6	.48
2N1356	PNP	80	6	.48
2N1357	PNP	85	6	.51
2N1358	PNP	55	8 ma.	POWER
2N1370	PNP	80	—	—

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2N1371	PNP	80	—	—
2N1372	PNP	45	—	—
2N1373	PNP	45	—	—
2N1374	PNP	70	—	—
2N1375	PNP	70	—	—
2N1376	PNP	95	—	—
2N1377	PNP	95	—	—
2N1378	PNP	200	—	—
2N1379	PNP	200	—	—
2N1380	PNP	100	—	—
2N1381	PNP	100	—	—
2N1382	PNP	80	—	—
2N1383	PNP	50	—	—
2N1386	NPN	90	0.10	.009
2N1387	NPN	40	0.10	.004
2N1388	NPN	—	0.50	—
2N1389	NPN	—	0.50	—
2N1390	NPN	--	0.80	—
2N1408	PNP	25	25	.62
2N1409	NPN	45	—	—
2N1410	NPN	90	—	—
2N1412	PNP	37.5	8 ma.	POWER
2N1416				
2T64	NPN	100	15	1.50
2T65	NPN	50	15	.75
2T66	NPN	25	15	.37
2T69	NPN	50	10	.50
2T73	NPN	49	8	.39
2T76	NPN	19	8	.15
2T78	NPN	45	2	.09
2T85	NPN	57	15	.85
2T201	PNP	24	8	.19
2T204	PNP	49	8	.39
2T205	PNP	49	8	.39
2T3011	PNP	70	2 ma.	POWER

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
2T3021	PNP	70	2 ma.	POWER
2T3031	PNP	32	3 ma.	POWER
2T3032	PNP	50	3 ma.	POWER
2T3033	PNP	80	3 ma.	POWER
2T3041				
2T3042				
2T3043				
3N25	PNP	65	20	1.30
3N34	NPN	25	—	—
3N35	NPN	25	—	—
3N36	NPN	9	10	.09
3N37	NPN	13	10	.13
3N45	PNP	40	2 ma.	POWER
3N46	PNP	40	2 ma.	POWER
44T1	PNP	54	16	.86
204A	NPN	29	—	—
320	PNP	125	6	.75
355	PNP	30	1 ma.	POWER
970	NPN	—	0.10 ma.	POWER
3604	NPN	13	10	.13
3607	NPN	32	10	.32
3609	NPN	32	10	.32
B177	PNP	150	—	POWER
B178	PNP	40	—	POWER
B179	PNP	25	—	POWER
CK4	PNP	60	5	.30
CK13	PNP	30	5	.15
CK14	PNP	60	5	.30
CK16	PNP	80	5	.40
CK17	PNP	140	5	.70
CK22	PNP	90	5	.45
CK25	PNP	30	25	.75
CK26	PNP	40	25	1.00
CK27	PNP	55	25	1.37
CK28	PNP	80	25	2.00

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
CK64	PNP	22	5	.11
CK65	PNP	45	5	.22
CK66	PNP	90	5	.45
CK67	PNP	180	—	—
CK754	PNP	300	—	—
CK870	PNP	12	—	—
CK871	PNP	20	—	—
CTP1104	PNP	30	2 ma.	POWER
CTP1108	PNP	30	2 ma.	POWER
CTP1109	PNP	60	2 ma.	POWER
CTP1111	PNP	30	2 ma.	POWER
CTP1112	PNP	20	—	POWER
CTP1117	PNP	100	—	POWER
CTP1127	PNP	20	—	POWER
CTP1133	PNP	40	—	POWER
CTP1137	PNP	75	—	POWER
CTP1222	PNP	20	10 ma.	POWER
CTP1500	PNP	37.5	—	POWER
CTP1503	PNP	37.5	—	POWER
CTP1504	PNP	52.5	—	POWER
CTP1506	PNP	52.5	—	POWER
CTP1508	PNP	52.5	—	POWER
CTP1511	PNP	90	—	POWER
CTP1512	PNP	90	—	POWER
CTP1513	PNP	90	—	POWER
CTP1514	PNP	90	—	POWER
CTP1530	PNP	37.5	—	POWER
GA52829	PNP	50	—	—
GA52830	PNP	215	100	21.5
GA53104	PNP	45	—	—
GA53149	PNP	49	10	.49
GA53194	PNP	19	5	.09
GA53213	PNP	24	15	.36
GA53242	PNP	80	0.045 ma.	POWER
GA53270	NPN	49	10	.49

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
GET103	PNP	55	15	.82
GET104	PNP	50	15	.75
GET105	PNP	60	20	1.20
GET106	PNP	60	15	.90
GET110	PNP	30	20	.60
GET111	PNP	60	40	2.40
GET114	PNP	55	15	.82
GET115	PNP	60	20	1.20
GET116	PNP	45	20	.90
GET120	PNP	30	20	.60
GET871	PNP	30	30	.90
GET872	PNP	60	30	1.80
GET873	PNP	35	3	.10
GET874	PNP	40	3	.12
GF45017	PNP	80	0.045 ma.	POWER
GFT20	PNP	33	20	.66
GFT20R	PNP	33	20	.66
GFT20/30	PNP	33	20	.66
GFT20/60	PNP	33	20	.66
GFT21	PNP	90	20	1.80
GFT21R	PNP	90	20	1.80
GFT21/30	PNP	90	20	1.80
GFT21/60	PNP	90	20	1.80
GFT22	PNP	150	20	3.00
GFT22R	PNP	150	20	3.00
GFT22/30	PNP	150	20	3.00
GFT22/60	PNP	150	20	3.00
GFT25	PNP	50	20	1.00
GFT25R	PNP	50	20	1.00
GFT25/30	PNP	50	20	1.00
GFT25/60	PNP	50	20	1.00
GFT31	PNP	30	20	.60
GFT31/30	PNP	30	20	.60
GFT31/60	PNP	30	20	.60
GFT32	PNP	50	20	1.00

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
GFT32/30	PNP	50	20	1.00
GFT32/60	PNP	50	20	1.00
GFT34	PNP	75	20	1.50
GFT34/30	PNP	75	20	1.50
GFT34/60	PNP	75	20	1.50
GFT44	PNP	100	20	2.00
GFT44/30	PNP	100	20	2.00
GFT45	PNP	40	20	.80
GFT45/30	PNP	40	20	.80
GFT3008/20	PNP	33	5 ma.	POWER
GFT3008/40	PNP	33	5 ma.	POWER
GFT3008/60	PNP	33	5 ma.	POWER
GRT3008/80	PNP	33	5 ma.	POWER
GFT3408/20	PNP	60	5 ma.	POWER
GFT3408/40	PNP	60	5 ma.	POWER
GFT3408/60	PNP	60	5 ma.	POWER
GFT3408/80	PNP	60	5 ma.	POWER
GFT4012/30	PNP	35	1 ma.	POWER
GFT4012/60	PNP	35	1 ma.	POWER
GFT8024	PNP	30	—	POWER
GT14	PNP	28	25	.70
GT20	PNP	42	25	1.05
GT31	PNP	20	—	—
GT32	PNP	40	—	—
GT33	PNP	60	—	—
GT34	PNP	20	25	.50
GT34HV	PNP	18	25	.45
GT34N	PNP	18	450	8.10
GT34S	PNP	15	100	1.50
GT35	NPN	40	100	4.00
GT41	PNP	30	—	—
GT42	PNP	60	—	—
GT43	PNP	100	—	—
GT74	PNP	75	25	1.87
GT75	PNP	150	25	3.75

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
GT81	PNP	75	25	1.87
GT81HS	PNP	120	0.25	.03
GT82	PNP	150	25	3.75
GT83	PNP	42	25	1.05
GT87	PNP	28	25	.70
GT88	PNP	80	25	2.00
GT109	PNP	110	25	2.75
GT122	PNP	90	25	2.25
GT123	PNP	90	6	.54
GT153	PNP	20	50	1.00
GT167	NPN	25	25	.62
GT222	PNP	20	20	.40
GT229	NPN	20	20	.40
GT758	PNP	15	25	.37
GT759	PNP	25	25	.62
GT759R	PNP	25	25	.62
GT760	PNP	40	5	.20
GT760R	PNP	60	25	1.50
GT761	PNP	70	5	.35
GT761R	PNP	70	25	1.75
GT762	PNP	120	5	.60
GT762R	PNP	120	25	3.00
GT763	PNP	200	5	1.00
GT792	NPN	100	220	22.00
GT792R	NPN	60	25	1.50
GT903	NPN	53	25	1.32
GT904	NPN	30	25	.75
GT905	NPN	30	25	.75
GT947	NPN	40	25	1.00
GT948	NPN	30	20	.60
GT948R	NPN	40	25	1.00
GT949	NPN	30	25	.75
GT1079	NPN	40	25	1.00
GT1200	NPN	20	25	.50
GT1201	NPN	30	25	.75

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
GT1202	NPN	30	25	.75
H3A	PNP	19	1 ma.	POWER
H4A	PNP	30	1 ma.	POWER
H12	PNP	50	20 ma.	POWER
H12A	PNP	50	20 ma.	POWER
H45	PNP	20	2 ma.	POWER
HA7520	PNP	9	0.10	.0009
HA7521	PNP	9	0.10	.0009
HA7522	PNP	15	0.10	.001
HA7523	PNP	15	0.10	.001
HA7524	PNP	15	0.10	.001
HA7525	PNP	15	0.10	.001
HA7526	PNP	37	0.10	.003
HA7527	PNP	37	0.10	.003
HA7528	PNP	37	0.10	.003
HA7530	PNP	9	0.10	.0009
HA7531	PNP	9	0.10	.0009
HA7532	PNP	15	0.10	.001
HA7533	PNP	15	0.10	.001
HA7534	PNP	15	0.10	.001
HA7535	PNP	15	0.10	.001
HA7536	PNP	37	0.10	.003
HA7537	PNP	37	0.10	.003
HA7538	PNP	37	0.10	.003
LT11	PNP	40	3 ma.	POWER
LT12	PNP	40	3 ma.	POWER
LT13	PNP	36	3 ma.	POWER
LT14	PNP	36	3 ma.	POWER
LT51	PNP	20	1 ma.	POWER
LT55	PNP	20	1 ma.	POWER
LT5021	PNP	20	1.5 ma.	POWER
LT5022	PNP	20	1.5 ma.	POWER
LT5023	PNP	40	1.5 ma.	POWER
LT5024	PNP	40	1.5 ma.	POWER
LT5025	PNP	40	1.5 ma.	POWER

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TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
LT5026	PNP	60	1.5 ma.	POWER
LT5027	PNP	60	1.5 ma.	POWER
LT5028	PNP	60	1.5 ma.	POWER
LT5029	PNP	40	1.5 ma.	POWER
LT5030	PNP	40	1.5 ma.	POWER
LT5031	PNP	40	1.5 ma.	POWER
LT5032	PNP	60	1.5 ma.	POWER
LT5033	PNP	60	1.5 ma.	POWER
LT5034	PNP	60	1.5 ma.	POWER
LT5035	PNP	20	2.0 ma.	POWER
LT5036	PNP	20	2.0 ma.	POWER
LT5037	PNP	40	2.0 ma.	POWER
LT5038	PNP	40	2.0 ma.	POWER
LT5039	PNP	40	2.0 ma.	POWER
LT5040	PNP	60	2.0 ma.	POWER
LT5041	PNP	60	2.0 ma.	POWER
LT5042	PNP	60	2.0 ma.	POWER
LT5043	PNP	20	2.5 ma.	POWER
LT5044	PNP	20	2.5 ma.	POWER
LT5045	PNP	20	2.5 ma.	POWER
LT5046	PNP	40	2.5 ma.	POWER
LT5047	PNP	40	2.5 ma.	POWER
LT5048	PNP	40	2.5 ma.	POWER
LT5049	PNP	60	2.5 ma.	POWER
LT5050	PNP	60	2.5 ma.	POWER
LT5051	PNP	60	2.5 ma.	POWER
LT5052	PNP	30	2 ma.	POWER
LT5053	PNP	30	2 ma.	POWER
LT5054	PNP	30	2 ma.	POWER
LT5055	PNP	60	2 ma.	POWER
LT5056	PNP	60	2 ma.	POWER
LT5057	PNP	60	2 ma.	POWER
LT5058	PNP	100	2 ma.	POWER
LT5059	PNP	100	2 ma.	POWER
LT5060	PNP	100	2 ma.	POWER

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
LT5061	PNP	30	2 ma.	POWER
LT5062	PNP	30	2 ma.	POWER
LT5063	PNP	30	2 ma.	POWER
LT5064	PNP	60	2 ma.	POWER
LT5065	PNP	60	2 ma.	POWER
LT5066	PNP	60	2 ma.	POWER
LT5067	PNP	100	2 ma.	POWER
LT5068	PNP	100	2 ma.	POWER
LT5069	PNP	100	2 ma.	POWER
LT5070	PNP	30	2.5 ma.	POWER
LT5071	PNP	30	2.5 ma.	POWER
LT5072	PNP	30	2.5 ma.	POWER
LT5073	PNP	60	2.5 ma.	POWER
LT5074	PNP	60	2.5 ma.	POWER
LT5075	PNP	60	2.5 ma.	POWER
LT5076	PNP	100	2.5 ma.	POWER
LT5077	PNP	100	2.5 ma.	POWER
LT5078	PNP	100	2.5 ma.	POWER
LT5079	PNP	30	3.0 ma.	POWER
LT5080	PNP	30	3.0 ma.	POWER
LT5081	PNP	30	3.0 ma.	POWER
LT5082	PNP	60	3.0 ma.	POWER
LT5083	PNP	60	3.0 ma.	POWER
LT5084	PNP	60	3.0 ma.	POWER
LT5085	PNP	100	3.0 ma.	POWER
LT5086	PNP	100	3.0 ma.	POWER
LT5087	PNP	100	3.0 ma.	POWER
LT5088	PNP	40	3 ma.	POWER
LT5089	PNP	40	3 ma.	POWER
LT5090	PNP	40	3 ma.	POWER
LT5091	PNP	80	3 ma.	POWER
LT5092	PNP	80	3 ma.	POWER
LT5093	PNP	80	3 ma.	POWER
LT5094	PNP	160	3 ma.	POWER
LT5095	PNP	160	3 ma.	POWER

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
LT5096	PNP	160	3 ma.	POWER
LT5097	PNP	40	3 ma.	POWER
LT5098	PNP	40	3 ma.	POWER
LT5099	PNP	40	3 ma.	POWER
LT5100	PNP	80	3 ma.	POWER
LT5101	PNP	80	3 ma.	POWER
LT5102	PNP	80	3 ma.	POWER
LT5103	PNP	160	3 ma.	POWER
LT5104	PNP	160	3 ma.	POWER
LT5105	PNP	160	3 ma.	POWER
LT5106	PNP	40	3.5 ma.	POWER
LT5107	PNP	40	3.5 ma.	POWER
LT5108	PNP	40	3.5 ma.	POWER
LT5109	PNP	80	3.5 ma.	POWER
LT5110	PNP	80	3.5 ma.	POWER
LT5111	PNP	80	3.5 ma.	POWER
LT5112	PNP	160	3.5 ma.	POWER
LT5113	PNP	160	3.5 ma.	POWER
LT5114	PNP	160	3.5 ma.	POWER
LT5115	PNP	40	4.0 ma.	POWER
LT5116	PNP	40	4.0 ma.	POWER
LT5117	PNP	40	4.0 ma.	POWER
LT5118	PNP	80	4.0 ma.	POWER
LT5119	PNP	80	4.0 ma.	POWER
LT5120	PNP	80	4.0 ma.	POWER
LT5121	PNP	160	4.0 ma.	POWER
LT5122	PNP	160	4.0 ma.	POWER
LT5123	PNP	160	4.0 ma.	POWER
LT5152	PNP	20	1.5 ma.	POWER
LT5153	PNP	20	1.5 ma.	POWER
LT5161	PNP	40	4 ma.	POWER
MN32	PNP	50	3 ma.	POWER
MN48	PNP	100	—	POWER
OC16	PNP	22	0.10 ma.	POWER
OC44	PNP	100	10	1.00

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
OC45	PNP	40	10	.40
OC57	PNP	50	1.5	.07
OC58	PNP	65	1.5	.09
OC59	PNP	90	1.5	.13
OC65	PNP	30	12	.36
OC66	PNP	47	12	.56
OC169	PNP	60	13	.78
OC170	PNP	80	—	—
OC171	PNP	—	—	—
OD650	PNP	24	2 ma.	POWER
OD651	PNP	14	2 ma.	POWER
OD651A	PNP	24	2 ma.	POWER
OD750	—	15	5 ma.	POWER
OD751	—	15	5 ma.	POWER
OD760	—	15	2 ma.	POWER
SB100	PNP	20	0.50	.01
SFT106	PNP	35	10	.35
SFT107	PNP	55	10	.55
SFT108	PNP	100	10	1.00
SFT113	PNP	40	1 ma.	POWER
SFT114	PNP	40	1 ma.	POWER
SFT115	PNP	60	30	1.80
SFT121	PNP	30	15	.45
SFT122	PNP	50	15	.75
SFT123	PNP	80	15	1.20
SFT126	PNP	30	5	.15
SFT127	PNP	50	5	.25
SFT128	PNP	100	5	.50
SFT135	PNP	30	5	.15
SFT136	PNP	50	5	.25
SFT141	PNP	30	10	.30
SFT142	PNP	50	10	.50
SFT150	PNP	40	1 ma.	POWER
SFT151	PNP	30	15	.45
SFT152	PNP	50	15	.75

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
SFT153	PNP	80	15	1.20
ST15	NPN	50	0.02	.001
ST45	NPN	50	0.02	.001
ST400	NPN	15	—	POWER
ST401	NPN	20	—	POWER
ST402	NPN	15	—	POWER
ST403	NPN	15	—	POWER
ST903	NPN	16	—	—
ST904	NPN	31	—	—
ST904A	NPN	60	—	—
ST905	NPN	65	—	—
ST910	NPN	140	—	—
ST3030	NPN	—	50	—
ST3031	NPN	40	1	.004
ST4150	NPN	25	—	—
T1000	—	—	—	—
T1001	—	—	—	—
TF65	PNP	45	5	.22
TF65/30	PNP	45	5	.22
TF70	NPN	10	150	1.50
TF71	NPN	24	200	4.80
TF72	NPN	99	—	—
TF77	PNP	23	0.03 ma.	POWER
TF77/30	PNP	32	0.03 ma.	POWER
TF78	PNP	—	—	POWER
TF78/30	PNP	—	—	POWER
TF80	PNP	45	0.10 ma.	POWER
TF80/30	PNP	45	0.10 ma.	POWER
TF80/60	PNP	45	0.10 ma.	POWER
THP35	NPN	—	5	—
THP36	NPN	—	5	—
THP45	PNP	110	—	POWER
THP46	PNP	110	—	POWER
THP47	PNP	110	—	POWER
THP61	NPN	—	5	—

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
THP62	NPN	—	5	—
TK20	PNP	40	—	—
TK20B	PNP	43	—	—
TK21B	PNP	23	—	—
TK23	PNP	50	—	—
TK24B	PNP	32	—	—
TK25	PNP	60	—	—
TK25B	PNP	63	—	—
TK26B	PNP	23	—	—
TK27B	PNP	32	—	—
TK28	PNP	—	—	—
TK30	PNP	40	—	—
TK31	PNP	60	—	—
TK40	PNP	90	—	—
TK41	PNP	40	—	—
TK42	PNP	70	—	—
TK70	NPN	50	—	—
TK71	NPN	30	—	—
TK72	NPN	25	—	—
TR34	PNP	15	—	—
TR269	PNP	40	20	.80
TR320	PNP	48	16	.76
TR321	PNP	80	16	1.28
TR526	PNP	73	10	.73
TR527	PNP	91	10	.91
TR721	PNP	45	—	—
TR722	PNP	22	—	—
TR-C44	PNP	80	10	.80
TR-C45	PNP	40	10	.40
TR-C70	PNP	30	10	.30
TR-C71	PNP	60	10	.60
TR-C72	PNP	100	20	2.00
TS13	PNP	60	—	—
TS14	PNP	35	—	—
TS17	PNP	90	—	—

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
TS1000	PNP	60	—	—
V10/1S	PNP	40	—	—
V10/2S	PNP	25	—	—
V10/15A	PNP	20	—	—
V10/30A	PNP	40	—	—
V10/50A	PNP	75	—	—
V15/10P	PNP	18	0.10 ma.	POWER
V15/15NP	PNP	25	0.10 ma.	POWER
V15/20P	PNP	24	0.10 ma.	POWER
V15/20IP	PNP	40	0.05 ma.	POWER
V15/20R	PNP	25	—	—
V15/30P	PNP	38	0.10 ma.	POWER
V15/30NP	PNP	40	0.10 ma.	POWER
V30/10P	PNP	18	0.10 ma.	POWER
V30/15NP	PNP	25	0.10 ma.	POWER
V30/20P	PNP	24	0.10 ma.	POWER
V30/20IP	PNP	40	0.05 ma.	POWER
V30/30NP	PNP	40	0.10 ma.	POWER
V30/30P	PNP	38	0.10 ma.	POWER
V60/10P	PNP	18	0.10 ma.	POWER
V60/20P	PNP	24	0.10 ma.	POWER
V60/20IP	PNP	40	0.05 ma.	POWER
V60/30P	PNP	38	0.10 ma.	POWER
WX1015	NPN	10	20 ma.	POWER
WX1015A	NPN	10	20 ma.	POWER
WX1015B	NPN	10	20 ma.	POWER
WX1015C	NPN	10	20 ma.	POWER
WX1015D	NPN	10	20 ma.	POWER
WX1015E	NPN	10	20 ma.	POWER
WX1015F	NPN	10	20 ma.	POWER
WX1016	NPN	10	20 ma.	POWER
WX1016A	NPN	10	20 ma.	POWER
WX1016B	NPN	10	20 ma.	POWER

TRANSISTOR NUMBER	TYPE	NOMINAL BETA	I_{co} (μa)	LEAKAGE. (ma.)
WX1016C	NPN	10	20 ma.	POWER
WX1016D	NPN	10	20 ma.	POWER
WX1016E	NPN	10	20 ma.	POWER
WX1016F	NPN	10	20 ma.	POWER
X30	NPN	6	—	POWER
X31	NPN	6	—	POWER
X32	NPN	6	—	POWER
XA101	PNP	35	5	.17
XA102	PNP	60	5	.30
XA103	PNP	35	5	.17
XA104	PNP	60	5	.30
XA124	PNP	60	20	1.20
XA131	PNP	60	—	—
XA141	PNP	45	—	—
XA142	PNP	45	—	—
XA143	PNP	45	—	—
XB102	PNP	30	10	.30
XB103	PNP	66	10	.66
XB104	PNP	30	10	.30
XC101	PNP	66	10	.66
XC121	PNP	74	.01 ma.	POWER
XC131	PNP	74	.01 ma.	POWER
XC141	PNP	70	3 ma.	POWER
XC142	PNP	70	3 ma.	POWER
XC155	PNP	75	0.50 ma.	POWER
XC156	PNP	75	0.50 ma.	POWER
XFT2	PNP	50	150	7.50
XS101	PNP	20	—	—
XT515	NPN	6	1000	6.00
XT516	NPN	6	1000	6.00
XT517	NPN	6	1000	6.00
XT519	NPN	13	—	—
XT520	NPN	13	—	—

If Leakage reading is off scale on regular transistor Leakage test, check for Leakage in Power position and read I_{co} directly on 0-2 ma. scale.

LAST "R"-15

LAST "C"-5

"SW-1" IN BETA POSITION

"SW-2" IN PNP POSITION

SWITCH PROTOCOL

SW-1 FUNCT. SWITCH

POS. 1 (OFF)	E1—F1	S1—T1
POS. 2 (LEAKAGE)	A1—B1 E1—H1	K1—M1 N1—P1 S1—T1
POS. 3 (BETA)	A1—B1 C1—D1	K1—L1 Q1—R1
	N1—O1	E1—G1
POS. 4 (V. OUT)	A1—B1	E1—I1
POS. 5 (I. LOAD)	A1—B1	E1—J1

SW-2 SELECTOR SWITCH

POS. 1 (POWER PNP)	A2—C2 D2—F2	G2—I2 J2—K2
POS. 2 (JCT. PNP)	A2—C2 D2—F2	G2—H2 J2—K2
POS. 3 (JCT. NPN)	A2—B2 D2—E2	G2—H2 J2—L2
POS. 4 (POWER NPN)	A2—B2 D2—E2	G2—I2 J2—L2

SW-1 SECT. A

SW-1 SECT. B

SW-1 SECT. C

SW-1 SECT. D

SW-1 SECT. E

SW-1 SECT. F

SW-1 SECT. G

SW-2 SECT. A

SW-2 SECT. B

SW-2 SECT. C

SW-2 SECT. D

117 V.A.C.

TP-13

SR-1

SR-1

C-1 100 @ 50VDC

R-1 2K 5%

R-2 150Ω 2W

R-3 1.5K

R-4 270 5%

R-5 270 5%

R-6 270 5%

R-7 1K

R-8 1.00Ω 100MA SHUNT 5%

R-9 HIGH BETA 750Ω CAL.

R-10 750Ω

R-11 20K

R-12 2.2K

R-13 22K

R-14 2.4K 5%

R-15 10K 5%

C-2 100 @ 50V.D.C.

C-3 .5@50V

C-4 .004

C-5 10 @ 10V. NON-POLARIZED

IN48

ME-9

TO-4

LOW BETA CAL.

BL'K.

GR'N.

RED

BLUE

RED

E

B

B-2

C

+

—

ALL RESISTORS ½ WATT 10% UNLESS OTHERWISE SPECIFIED

ALL CONDENSERS MFD. UNLESS OTHERWISE SPECIFIED

B & K MANUFACTURING COMPANY

SCALE: ~	APPROVED BY	DRAWN BY C.E.F.
DATE: 3-3-60		REVISED

MODEL #160 TRANSISTOR TESTER

JOB MODEL #160	DRAWING NUMBER SCH.160-W1

B & K Model 160 Parts and Price List

SCHEMATIC SYMBOL	DESCRIPTION	B & K PART No.	DEALER'S NET
C-1	100 MFD 50V Electrolytic Capacitor	CL-100-50	.84
C-2	100 MFD 50V Electrolytic Capacitor	CL-100-50	.84
C-3	.5 MFD 50V Paper Tubular Capacitor	CP-A5-50	.45
C-4	.004 MFD 500V Disc Ceramic Capacitor	CC-A004-500-10	.12
C-5	10 MFD 10V Electrolytic Capacitor	CL-10-10	.84
ME-9	Meter	ME-9	11.34
R-3	Volt Adjust Control	P-51	1.68
R-8	1 Ohm ½W 10% Resistor	RW-1-A-5	.24
R-9	High Beta Cal. (Internal)	P-53	.27
R-10	Low Beta Cal. (Internal)	P-53	.27
R-11	Beta Control	P-52	1.92
SR-1	Selinium Rectifier	E-100	1.08
SW-1	Function Switch	S-41	1.17
SW-2	Selector Switch	S-42	1.83
TO-4	Oscillator Transformer	TO-4	1.65
TP-13	Power Transformer	TP-13	1.98
	Case	A-143A	5.25
	Rear Cover	A-144A	.90
	Transistor Test Leads	ASM-41	Per Set 1.08
	Power Supply Leads	ASM-42	Per Set 1.32
	1N48 Diode	D-1N48G	.60
	Transistor Socket with Mtg. Ring	GT-4	.42
	Alligator Clip Small	H-44	.06
	¼" Rubber Grommet	H-93	.02
	Leather Handle	H-174	.39
	Alligator Clip Large	H-181	.09
	Line Cord Strain Relief	H-195	.06
	Rubber Foot	H-215	.03
	Rubber Bumper (Back)	H-216	.03
	Clip Insulator, Large, Black	IN-10	.06
	Clip Insulator, Large, Red	IN-11	.06
	Clip Insulator, Small, Red	IN-21	.06
	Clip Insulator, Small, Blue	IN-22	.06
	Clip Insulator, Small, Green	IN-23	.06
	Clip Insulator, Small, Black	IN-24	.06
	Tip Plug, Black	J-4	.18
	Tip Plug, Red	J-5	.18
	Tip Jack, Red	J-17	.12
	Tip Jack, Black	J-27	.12
	Knob, 1" Dia.	K-3	.24
	Knob, 1⅝" Dia. (Beta)	K-11	.69
	Knob, 1⅝" Dia. Skirt Only (Part of Beta Knob)	K-12	.12
	Scale (Part of Beta Knob)	K-10	1.17
	Carton and Fillers	PKG.-49	.75
	Instruction and Beta Chart Book	PM-65	2.55
	6 Foot AC Line Cord	W-14	.30

(Prices subject to change without notice)

NOTE: Standard value resistors are not listed. Values may be obtained from schematic diagram.

FORM PM-67 3-60 RR PRESS

MODEL 160

CONDENSED OPERATING INSTRUCTIONS FOR BETA TEST

1. SET THE BETA KNOB TO 300.
2. ROTATE THE BETA KNOB CLOCKWISE SLOWLY, AS SOON AS THE METER NEEDLE BEGINS TO INDICATE, STOP!
3. TURN THE BETA KNOB COUNTER CLOCKWISE UNTIL THE METER NEEDLE IS AGAIN AT ZERO.
4. NOW VERY CAREFULLY TURN KNOB CLOCKWISE UNITL THE NEEDLE RISES FROM ZERO TO SET BETA LINE ON THE METER. THIS LINE IS VERY CLOSE TO THE ZERO POINT AND IS A CRITICAL ADJUSTMENT.
5. READ THE TRUE BETA DIRECTLY OFF THE BETA KNOB SCALE.

NOTE;

A TRANSISTOR WHOSE ACTIVE BETA IS OVER 300 WILL INDICATE A METER READING EVEN WHEN THE BETA KNOB IS AT 300.

PM-216

WARRANTY

Your MODEL 160 TRANSISTOR TESTER is made of the finest material and then carefully tested at the factory before shipment. It carries the standard RETMA warranty against defects in material and workmanship for a period of 90 days from date of purchase. Should any defect be discovered within this warranty period, return the unit to the distributor from whom it was purchased.

BE SURE TO MAIL YOUR WARRANTY REGISTRATION CARD IMMEDIATELY TO REGISTER YOUR UNIT WITH THE FACTORY.

B & K MANUFACTURING COMPANY

1801 W. BELLE PLAINE AVE. • CHICAGO 13

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